Regarding "National outcomes for the treatment of ruptured abdominal aortic aneurysm: Comparison of open versus endovascular repairs"

Egorova et al[1] showed an increased survival after ruptured abdominal aortic aneurysm (RAAA) of patients who were treated with endovascular aortic repair (EVAR) as compared with those treated with open aortic repair (OAR): adjusted hazard ratio (HR), 0.857; 95% confidence interval (CI), 0.768 to 0.957; $P = .0061$; for patients matched by propensity score (n = 2,088). To our knowledge, there has been only one randomized controlled trial[2] of EVAR versus OAR for RAAA. Meanwhile, although a lot of observational comparative studies reported mortality, odds ratios (ORs), or HRs, most of them are not adjusted but crude ones. In an attempt to correct for and minimize selection bias that exists in observational studies, we previously performed a meta-analysis pooling not crude but adjusted ORs (representing 6,097 patients) and demonstrated no benefit of EVAR over OAR for mortality in RAAA (pooled OR, 0.71; 95% CI, 0.41 to 1.22; $P = .21$).[3] We herein updated our previous meta-analysis[3] of randomized controlled trials and high-quality (reporting adjusted ORs or HRs for mortality) observational comparative studies (including the study by Egorova et al[1]).

Our comprehensive search identified one randomized controlled trial[2] and six (two prospective[4,5] and four retrospective[1,6-8]) high-quality (reporting adjusted ORs or HRs) observational comparative studies. We excluded observational comparative studies reporting only crude mortality, ORs, or HRs. Pooled analysis of the OR from the randomized controlled trial and the adjusted ORs from the observational comparative studies (representing 18,116 patients; 2,382 in the EVAR group and 15,734 in the OAR group) demonstrated a statistically significant 23% reduction in mortality with EVAR relative to OAR in a random-effects model (pooled OR, 0.77; 95% CI, 0.64 to 0.93; $P = .007$) (Fig). There was significant between-study heterogeneity of results analyzed by means of standard χ^2 tests ($P = .04$) but no evidence of significant publication bias assessed mathematically using an adjusted rank-correlation test ($P = .45$).

The present meta-analysis of one randomized controlled trial and six high-quality (reporting adjusted ORs or HRs) observational comparative studies demonstrated significant benefit of EVAR over OAR for mortality in RAAA, which strengthened the results of the study by Egorova et al.[1]

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Reply

We appreciate the support for our data from the writers. We agree that in order to reach valid and clinically significant conclusions utilizing observational data, investigators must reach beyond crude estimates and strive to adjust for possible variables that might confound their conclusion. In this analysis, to control for patient, hospital, and surgeon characteristics, a propensity model was developed and patients undergoing open repair were matched to those undergoing endovascular abdominal aortic aneurysm repair (EVAR) by their propensity score. In this way we controlled for selection bias by constructing a propensity score. This method resulted in two matched cohorts similar in all variables and allowed confidence in our conclusion that the outcome of decreased mortality can be attributed to the endovascular approach to ruptured aortic aneurysms. We feel that, in order to more accurately reflect the comparison of two technologies for treating a given disease process, the use of randomized trials or propensity scores for nonrandomized trials are critical for accurate data analysis. We appreciate the validation of our data analysis by this meta-analysis.

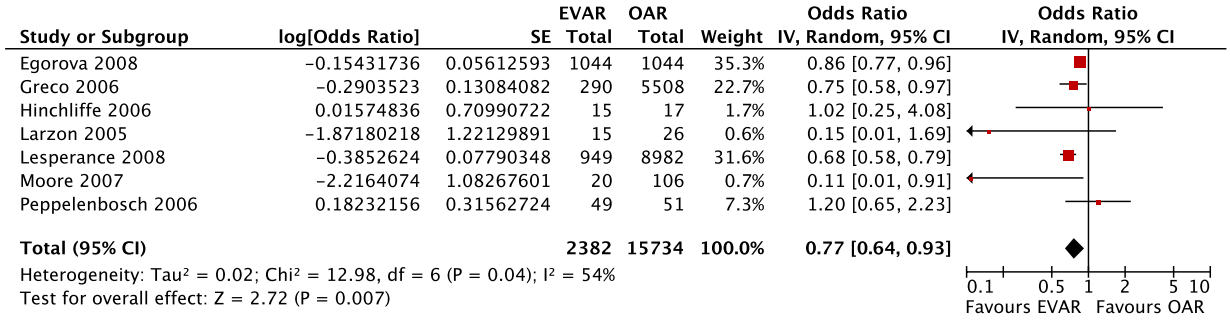

Fig. Forest plot of adjusted odds ratios for mortality of included studies.